



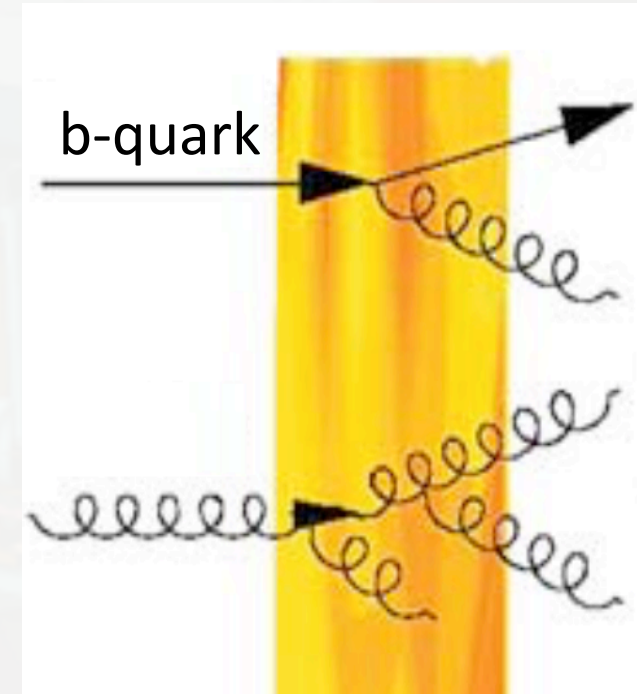
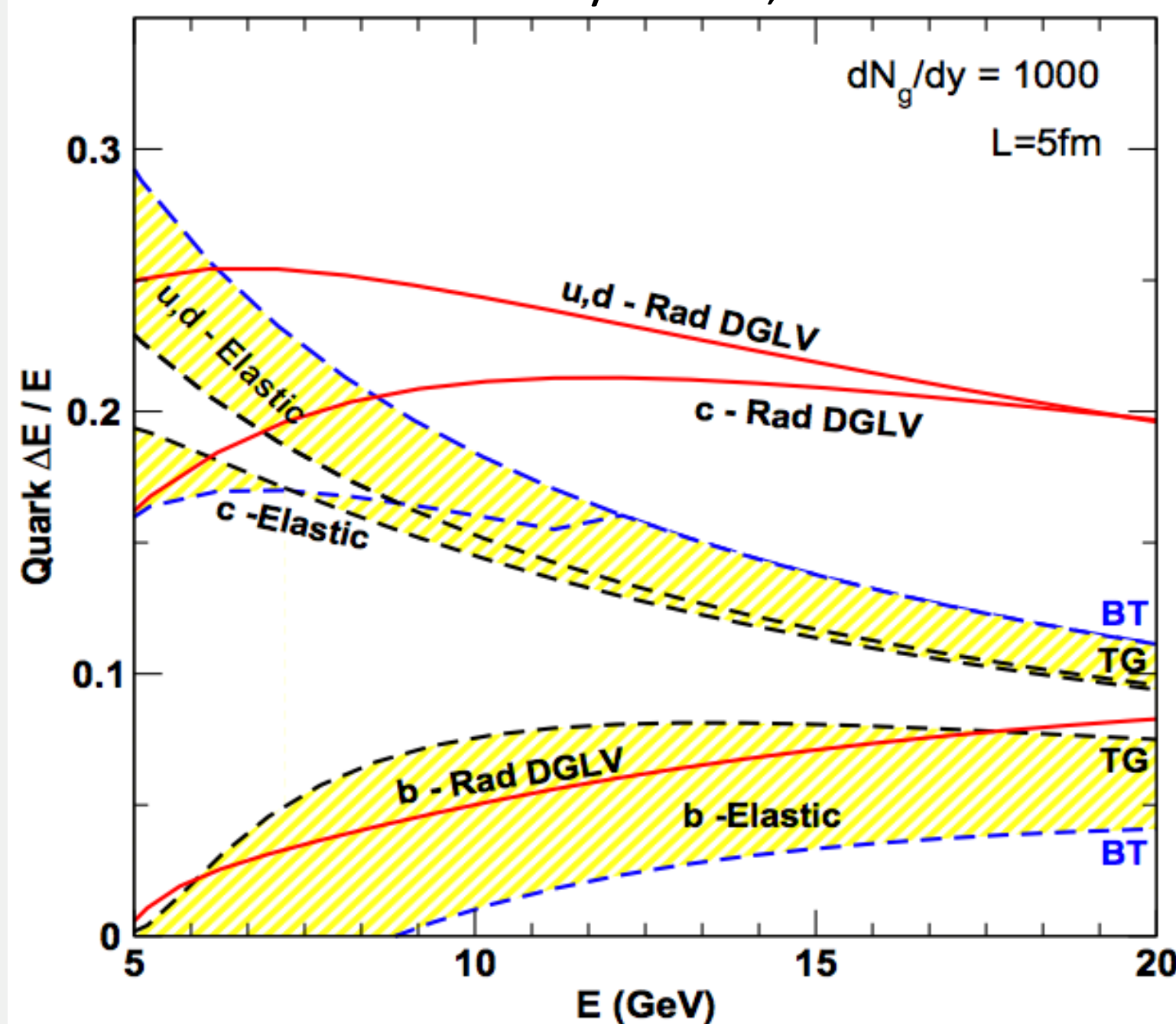
Cesar da Silva, *for the sPHENIX Collaboration*

## Abstract

Flavor dependency of the jet quenching in QGP is an important tool to reveal different contributions from radiative and collisional energy loss in the medium. B-tagged jets measured in LHC indicates no flavor dependency but in a  $p_T$  region where quark mass may not be relevant to energy loss mechanisms. B-tagging using vertex displaced jets can be measured in a much lower  $p_T$  region at RHIC in the future sPHENIX. Monolithic Active Pixel Sensor detector (MAPS) is an implementation of a technology developed for 15 years to measure vertex displacements in high occupancy environments. The implementation of the MAPS detector in sPHENIX, expected performance and implications in the heavy ion field will be discussed in this poster.

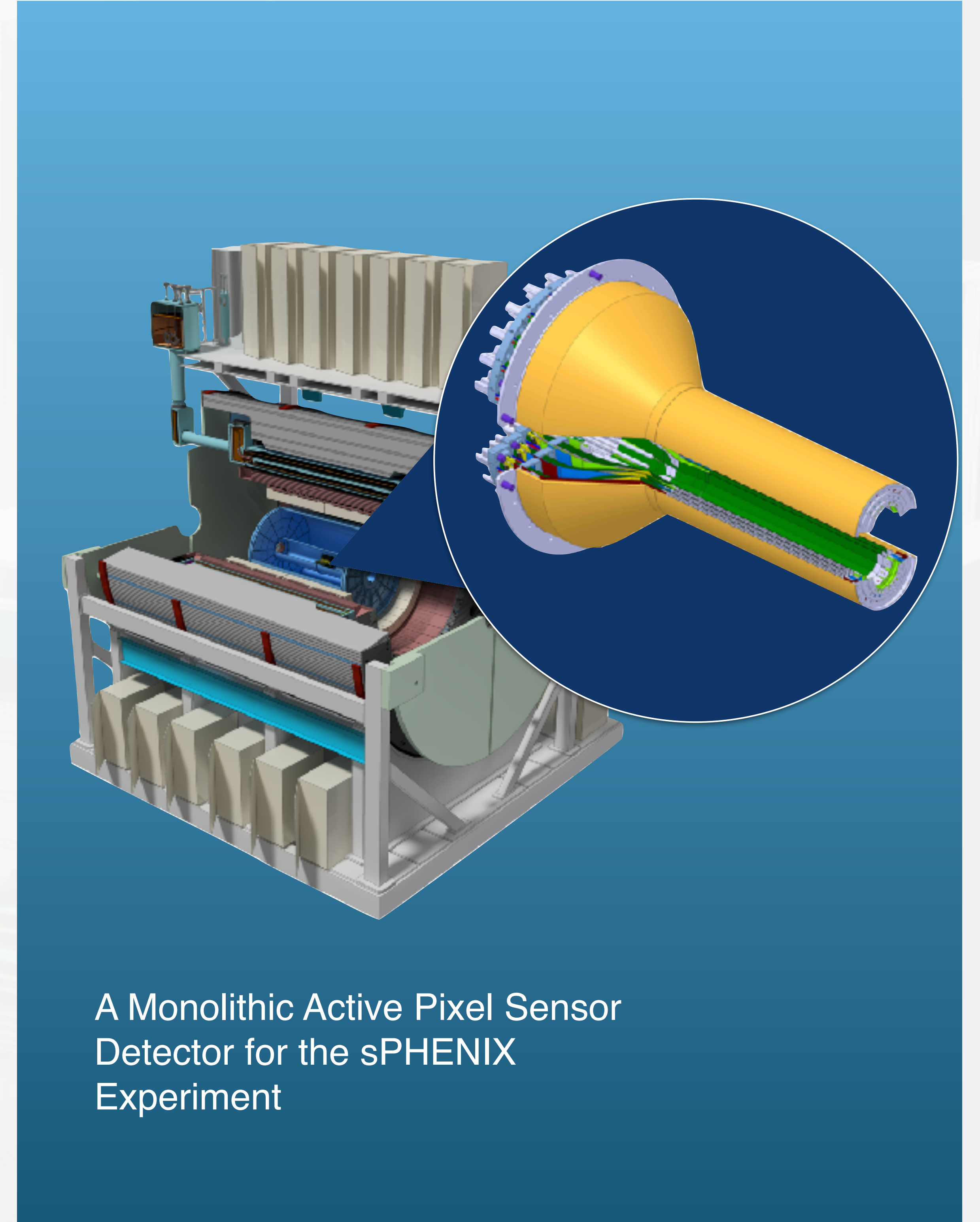
## Parton interaction with Quark-Gluon Plasma medium

Wicks et al. Nucl. Phys. A784, 426



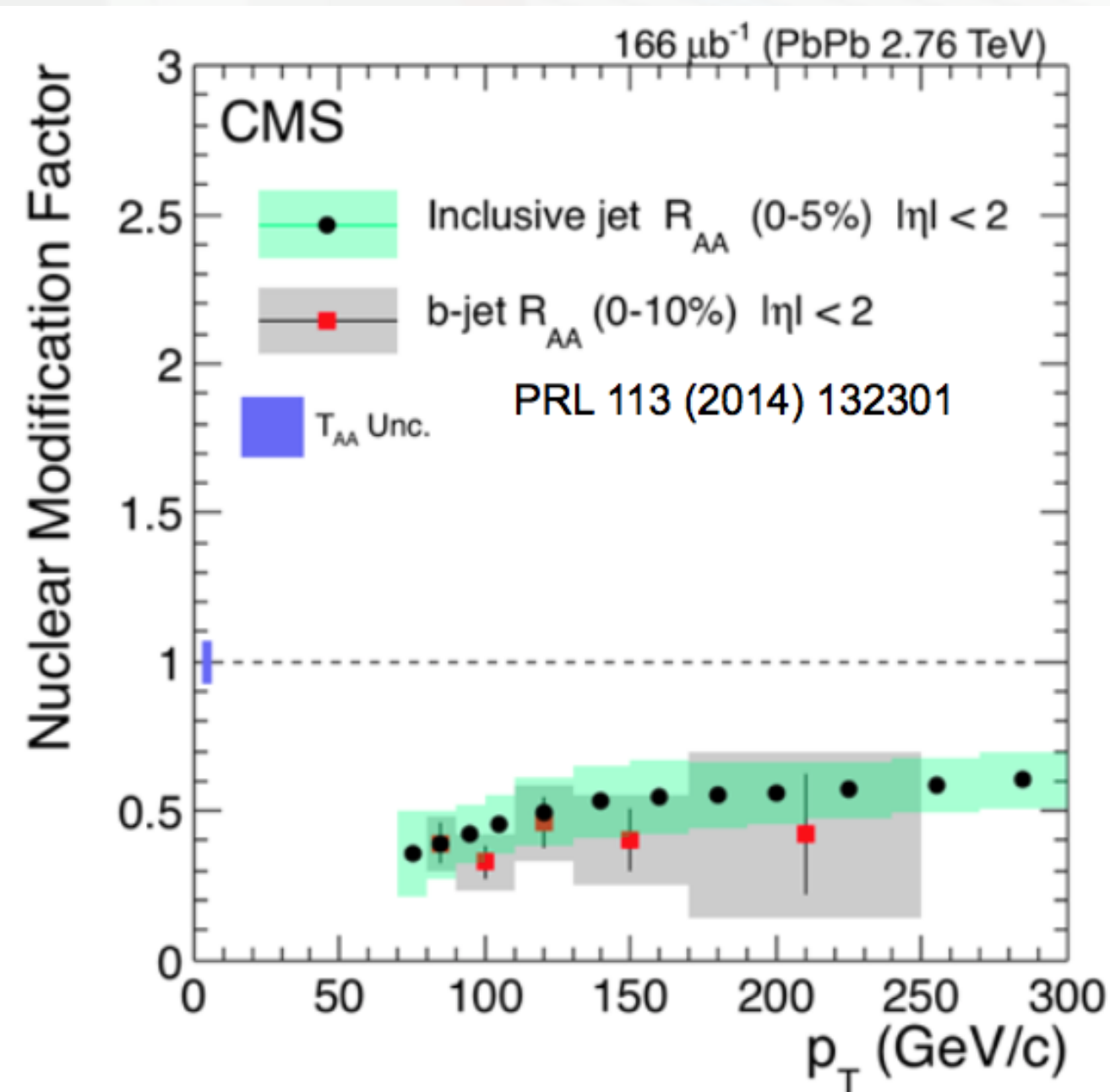
light quarks and jets lose energy in QGP mainly through gluon radiation

b-quarks also lose energy in elastic collisions with QGP virtual particles



A Monolithic Active Pixel Sensor Detector for the sPHENIX Experiment

## b-jets at LHC

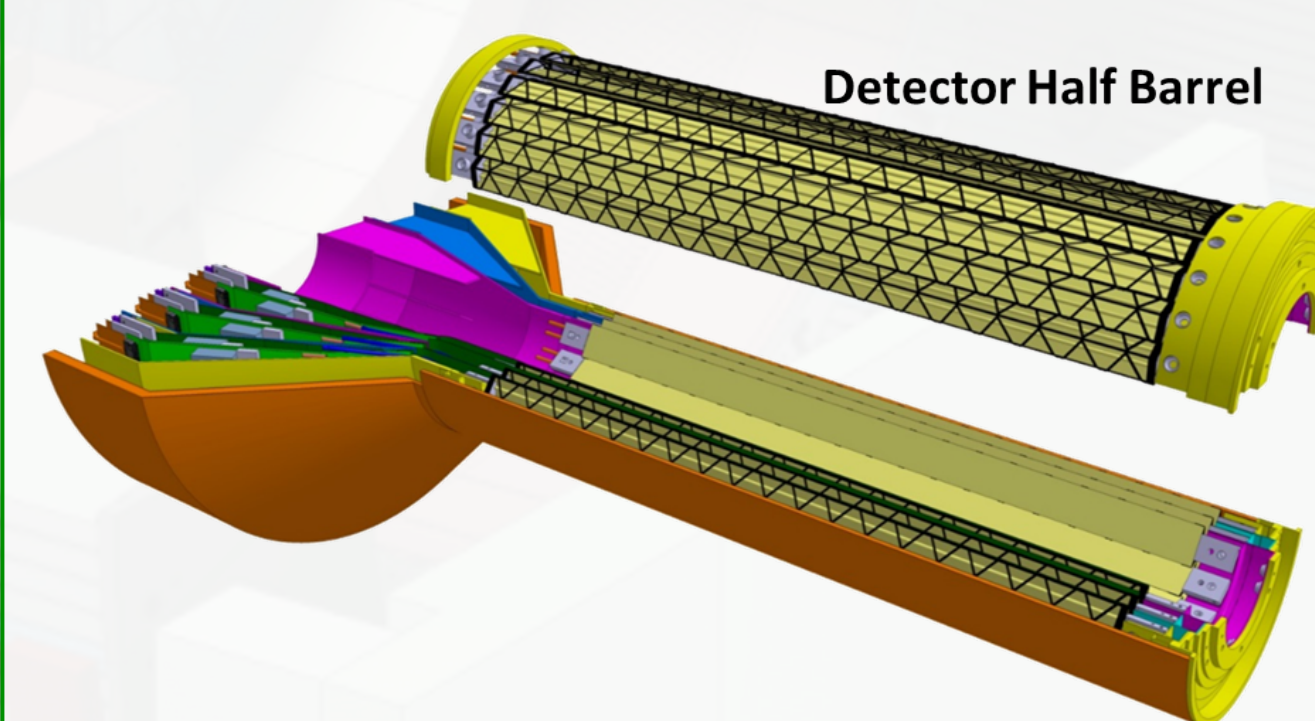


Same suppression as in inclusive jets (mostly gluon jets).

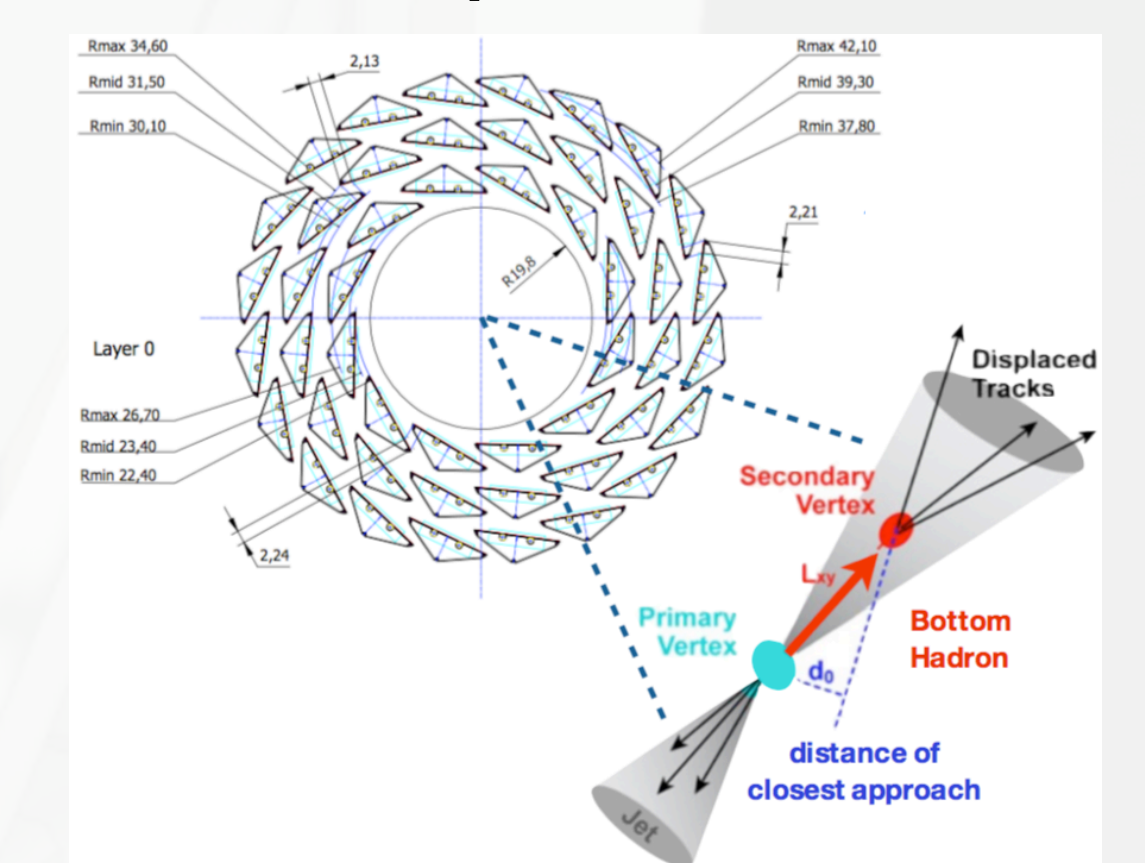
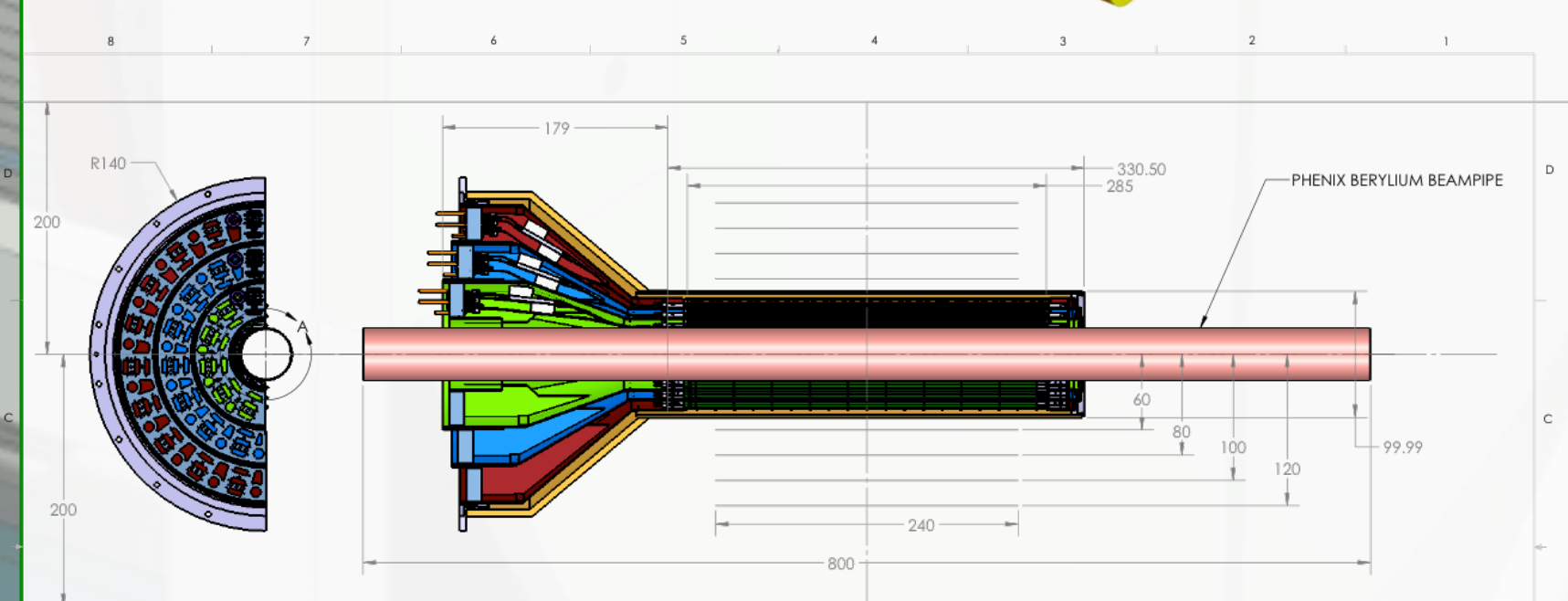
- b-jets are mostly from gluon splitting at LHC, they cross the QGP as a massive gluon in an octet state, similar to a gluon jet

- Quark mass may be irrelevant for energy loss when  $p_T > 80$  GeV/c

## MVTX Detector Layout

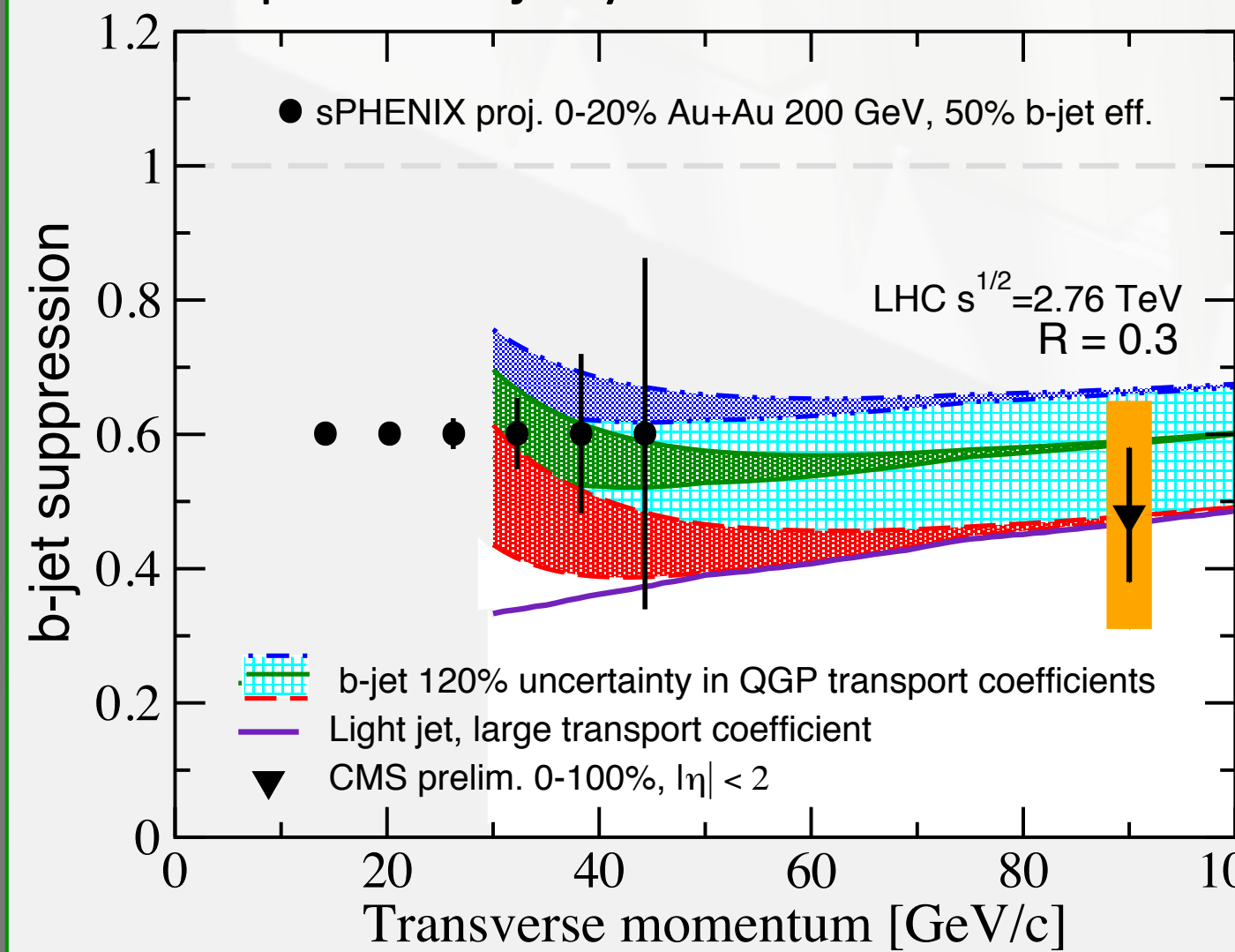


- Clone of inner ALICE ITS : 15 years R&D involved
- 0.18  $\mu\text{m}$  CMOS TowerJazz technology
- 211M channels pixel detector: 30  $\mu\text{m}$  pitch
- Signal amplification, digitalization and zero suppression on the chip.



## b-jets at RHIC measured by sPHENIX

Expected b-jet yields in sPHENIX.



Expect 100B events in Au+Au collisions

Trigger only on Minimum Bias in Au+Au collisions.

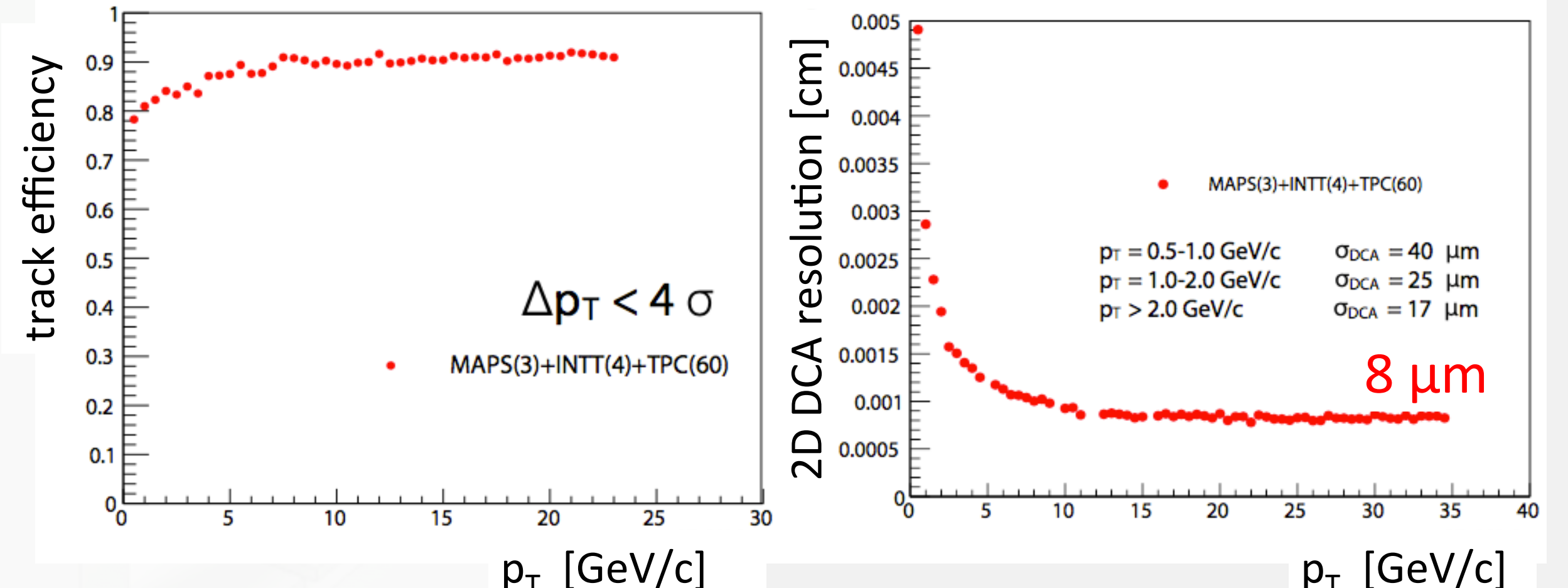
Reach a low  $p_T$  range where

- quark mass may be relevant for energy loss
- More dominance of collisional energy loss

Gluon splitting has a very small contribution for b-quark formation.

Ideal experiment to finally probe QGP with real b-quarks.

## Detector Performance



b-jet tagging performance can be seen in poster (Haiwang Yu)

More MVTX detector details can be seen in poster (Ming Liu)